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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/607,256	06/30/2000	David M. Barth	042390.P7708	9801

7590

02/09/2004

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EXAMINER

CASIANO, ANGEL L

ART UNIT

PAPER NUMBER

2182

DATE MAILED: 02/09/2004

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/607,256

Applicant(s)

BARTH ET AL.

Examiner

Angel L. Casiano

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☒ Claim(s) 43-58 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to communication 14 November 2003.
2. Claims 1-3, 5-17, 19-31, 33-42 and 43-58 are pending in the application. Claims 43-58 are newly added.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 15 October 2003 has been entered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5, and 7-17, 19-31, 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Salgado [US 5,579,447].

Art Unit: 2182

Regarding claim 1, Salgado discloses a method including (see col. 12, lines 58-60) starting an Input/Output (I/O) request to a device (see col. 12, lines 60-65). The Salgado reference does not expressly include a *scheduling driver* to start the I/O request, but it does teach its functionality, since it includes programming and selecting the jobs to be performed (see col. 13, lines 58-59; col. 14, lines 27-31). This method in the reference is capable of determining if the device is busy (see col. 10, lines 26-32) and if the device is busy (see column 1, lines 16-18), it provides an estimated processing time for the request to be completed (see Abstract; col. 2, lines 10-15). The method disclosed in the reference includes “sleeping” for an estimated processing time (see col. 11, lines 36-40). If the device is busy, the requests for service must wait, according to the estimated processing times calculated for each of them. The method disclosed in the reference provides for managing several requests for service in the same device. Therefore, the determined estimated processing time indicates sleeping time for the job request. It is well known in the art that an *application* is a program that performs a particular function for the user. One of ordinary skill in the art would have been motivated to establish that the method, as cited by Salgado, teaches scheduling requests to a device for an application, since these steps are included in the cited disclosure (see citations above). Furthermore, the reference does teach different devices, useable by an application (see col. 4, line 27). Although these devices are part of a “printing subsystem” (see col. 6, line 59), the cited subsystem included a plurality of devices itself (see Figs. 1, 2, 6; col. 7, lines 3-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the cited plurality of devices receives an I/O request, as part of the “printing subsystem”.

Art Unit: 2182

As for claims 5 and 7, the method in the reference discloses obtaining and providing the I/O operation results (see Figure 10, steps “174”, “175”, “178”) after “sleeping” (see claim 4) for an estimated processing time. The method also determines if the I/O request has been completed (Figure 10, “178”). Although the prior art does not mention a scheduling driver, the method disclosed by the reference includes programming that select the jobs to be performed (scheduling) (see col. 13, lines 58-59; col. 14, lines 27-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made that I/O devices (e.g. printer) use a driver, which is software that controls the hardware component. Therefore, it would have been obvious that the I/O device in the reference has a driver that schedules the different jobs (requests).

As for claim 8, Salgado does not include “sleeping for a timer tick interval if the I/O request has been completed”. However, since Salgado discloses jobs waiting (see col. 11, lines 35-40) to be completed, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to allow the subsequent requests to start, a transition period is needed.

As for claim 9, the method that Salgado teaches explicitly includes calculating a new processing time for completing the I/O request, if the request has not been completed (see Figure 8, “172”, “174”, “176”, “178”; col. 13, lines 23-25).

As for claims 10 and 11, the Salgado reference discloses calling the method to obtain the I/O operation results and determining if the I/O request has been completed (see Figure 8, “172”,

Art Unit: 2182

“174”, “176”, “178”). If the request has not being completed, the method in the reference repetitively performs the time estimation calculation until the request has been completed. However, the reference does not expressly mention, “sleeping for the estimated processing time”. Nonetheless, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to allow the subsequent requests to start, a transition period is needed. In the prior art, the job continues and the estimated processing time is updated (col. 10, lines 49-51).

As for claim 12, if the device is busy, the reference estimates an amount of time left and provides the amount of time (see col. 11, lines 36-40).

As for claims 13 and 14, the method in the cited reference sleeps for the estimated amount of time left and then starts the I/O request. However, the reference does not teach repetitively performing the operation of calling and determining if the device is busy. Nonetheless, if the device was performing a previous job, it does not become available (see Figure 8) until the previous job is done. Therefore, the queued jobs do not need to repeatedly perform the operations, since each of them (col. 11, lines 36-40) has an estimated time for service. The amount of time that a request needs in order to be completed is disclosed in the reference as being continuously updated. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the estimated time left to complete a previous job is indicative of the amount of time left to service a subsequent request.

Art Unit: 2182

Regarding claims 15-17 and 19-28, these constitute the machine-readable instructions for the method of claims 1-3, 5-14. The method claims are rejected in the present Office action. Therefore, these claims are rejected under the same rationale.

Regarding claims 29-31 and 33-42, the Salgado reference teaches an apparatus comprising a processor and a memory. The apparatus in these claims is directed to the method of claims 1-3 and 5-14. The method claims are rejected in the present Office action. Therefore, these claims are rejected under the same rationale.

6. Claims 2-3, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Salgado [US 5,579,447] in view of Lenny [US 6,467,054].

Regarding claim 2, Salgado does not mention determining whether a locked flag is set (device busy) or not (device not busy). Nonetheless, Lenny teaches a method that includes (Fig. 9, "158"; col. 2, lines 60-61) setting a flag to indicate that a device is busy. If the flag is not set in the Lenny reference, the device is not busy. It would have been obvious to modify the Salgado reference by including a flag, since its use is well known in the art as an indicator in methods and processes.

As for claim 3, Salgado does not disclose a method that includes setting a locked flag if the device is not busy. However, Lenny teaches a method that includes (Fig. 9, "158"; col. 2, lines 60-61) setting a flag to indicate that a device is busy. It would have been obvious to one of

Art Unit: 2182

ordinary skill in the art that a flag is an indicator and that it can be set to identify the device as being available (not busy).

Regarding claim 6, Salgado does not include in its disclosure the step of clearing a locked flag if the I/O request has been completed. Nonetheless, Lenny teaches a method that includes (Fig. 9, "158"; col. 2, lines 60-61) setting a flag to indicate that a device is busy. It would have been obvious to one of ordinary skill in the art that a flag is a variable, which that can take one of two values and used to indicate one of two outcomes or to control which of two things is to be done. Therefore, although Lenny does not use a locked flag to indicate completion of an I/O request, it would have been obvious to one of ordinary skilled in the art, that the Salgado reference (Figure 10) would have been modified to include a flag (indicator) showing that the request was completed, as one of two outcomes disclosed in the prior art.

Allowable Subject Matter

7. Claims 43-58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 43, the prior art does not teach or suggest, alone or in combination a method as found in claim 1, where the *scheduling driver* implements a *protocol* using time estimates, enabling the scheduling driver to be used in combination with a *device that does not generate interrupts*. As for claim 44, the prior art does not teach or suggest *synchronizing* a system clock

Art Unit: 2182

with a clock associated with a scheduling driver. Regarding claims 45-47, the prior art does not include or suggest a method (as disclosed in claim 1) further having a scheduling driver as a *passive software* component, where this is loaded into an operating system. Regarding claims 48-50, the prior art does not teach a method (as included in claim 1) having the additional steps of specifying a *zero time interval* by the driver, sleeping for a *timer tick interval*, thereby yielding a *time slice* by the application and switching the CPU to a next application.

Claims 51-58 are objected as being dependent upon the rejected system claims, but include similar limitations disclosed in claims 43-50.

Response to Arguments

9. Applicant's arguments filed 15 October 2003 have been fully considered but they are not persuasive. Accordingly, claims 1-42 are rejected in the present Office action. Regarding claim 1, Salgado teaches a "printing subsystem". As admitted by the applicant in the arguments submitted, "scheduling of print jobs is inherent to a print engine" (see page 13 of 16). In another aspect of the claim, Examiner agrees with applicant's appreciation that Salgado does not explicitly teach a "scheduling driver". However, by definition, it is well known in the art that a "scheduling driver" is a set of instructions used to *schedule jobs for execution*. Salgado teaches programming and selecting jobs to be performed, as exposed in the present Office action.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Harris et al. [US 6,438,704 B1] teaches system and method for scheduling use of system resources among a plurality of limited users.
- Suzuki et al. [US 6,213,652 B1] teaches job scheduling system for print processing.
- Lindsley [US 6,128,672] discloses a multi-task execution processor having a preemptive prioritized task scheduling system.
- Ishizuka et al. [JP05035701A] teaches effective use of a processor by comparing the processing waiting time with the scheduled processing waiting time of the processor of its own system and another system respectively and then selecting and controlling a system of the shortest waiting time.
- Takahashi [JP04153837A] teaches timer request processing system.
- Shimamura et al. [JP01067630A] teaches job scheduling control system.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel L. Casiano whose telephone number is 703-305-8301. The examiner can normally be reached on 8:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 703-308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2182

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

alc
February 4, 2004



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